REMARKS

Claims 1-21, 35-58, and 64-74 will be pending upon entry of the present amendment. Claims 50-53, 64, 72, and 73 are amended.

The Examiner has rejected claims 50-53, 72, and 73 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. In particular, the Examiner notes terms such as "a valve body," "an expansion chamber," "a liquefied gas inlet chamber," and others as needing to be clearly distinguished over other similar terms. Accordingly, claims 50-53, 72, and 73 have been amended substantially as suggested by the Examiner. These amendments do not narrow the respective claims, and are not made to distinguish the claims over the prior art. Accordingly, the scope of the respective claims is not changed either directly, or with respect to the Doctrine of Equivalents.

Claim 64 has been amended to correct several typographical errors. This amendment is cosmetic in nature and does not relate to patentability of claim 64, nor does it affect the scope of the claim.

Applicants thank the Examiner for a personal interview with the undersigned representative to discuss the merits of the present application. In that interview, the Examiner indicated a willingness to reconsider his rejection, and allow the claims in light of the distinguishing features presented in the interview; these are in the remarks as requested by the Examiner.

Prior to addressing the particular rejections, applicants wish to review for the Examiner the structure and function of a capacity control valve according to an embodiment of the invention, and to contrast that with the prior art.

Referring to Figure 1, a capacity control valve 30 is illustrated, including a valve inlet 34, an outlet 38, a temperature sensing member 50, a diaphragm 48, an inlet chamber 44, an outlet chamber 46, and a valve member 62. It may be seen that the valve member 62 is directly coupled to the diaphragm 48, such that movement of the diaphragm 48 controls opening and closing of the central orifice 58. The temperature sensing bulb 50 is coupled to a thermal expansion chamber 42 on one side of the diaphragm 48, such that, as pressure within the

chamber 42 varies in response to changes in temperature at the temperature sensing bulb 50, the diaphragm 48 is exposed to those changes in pressure. On the other hand, the inlet chamber 44 is coupled directly to the valve inlet 34, such that pressure of liquefied gas entering via the inlet 34 is felt directly on the opposite side of the diaphragm 48. In this way, opening and closing of the valve 62 is directly in response to a comparison of the sensed temperature pressure on one side of the diaphragm 48 with the pressure of the incoming liquefied gas on the other side of the diaphragm.

Referring now to Figure 3 of Tanaka et al. (U.S. Patent No. 5,005,370, hereafter "Tanaka"), a valve is shown that is representative of much of the prior art cited. Tanaka's valve includes a thermal tube 64 which provides a pressure in a chamber 61 on a first side of a diaphragm 58. Tanaka's valve also includes a capillary tube 76, which is configured to couple the evaporator with a chamber 65 on the opposite side of the diaphragm 58. This represents a fundamental difference between the refrigeration control valve of Tanaka's Figure 3 and the capacity control valve of applicants' Figure 1. Tanaka's valve does not provide for an inlet pressure such as at the inlet 54 to be felt on one side of the diaphragm 58, and thus is different in structure and operation from the applicants' device.

Nielsen (U.S. Patent No. 4,032,070) and Barbulesco (U.S. Patent No. 2,856,759) each teach valves that function in a manner similar to that described with reference to Tanaka. For example, referring to Nielsen's column 2, lines 57 and 58, Nielsen states, "The space 14 below the diaphragm communicates with the outlet pressure by way of port 15."

For his part, Barbulesco teaches, "The push pins 80 are sufficiently loose in the passage that the refrigerant may flow from the outlet passage up into the interior of the bellows 82 so that the interior of the bellows will be responsive to the pressure in the outlet passage 90." (Column 2, lines 56-61).

In both of these examples it is clear that the respective valves are configured to respond to pressure of the refrigerant at the outlet of the valve. In contrast, applicants' valve is configured to respond to pressure at the inlet of the valve. Inasmuch as the pressure at the inlet of any valve will be different from the pressure at the outlet of that same valve, due to the pressure drop across the valve, and that difference will vary with respect to the degree of

openness of the valve, it is clear that the applicants' device, according to the embodiment of Figure 1, is functionally different from the devices of Tanaka, Nielsen, and Barbulesco.

Referring now to Figure 4 of Milner (U.S. Patent No. 6,584,998), it may be seen that the Milner reference teaches a device configured to respond to changes in pressure in a supply line 121, such that the valve 31 of Milner is configured to open in the event that a primary source of evaporated gas drops below a selected pressure. The upper chamber 47 of the valve 31 receives a pressure input 49 that is ultimately controlled by the pilot valve 75, which operates in response to pressure at the supply line 121. Additionally, there is no indication that pressure from the inlet of the valve 31 is felt on the opposite side of the diaphragm 45. Milner shows an unnumbered barrier between the valve inlet 33 and the diaphragm 45. While Milner does not discuss this barrier, it is reasonable to assume that this barrier is a sealed closure, which would be consistent with a similar unnumbered barrier of pilot valve 75 which, based upon the described operation of the pilot valve 75, must be sealed for the valve to operate properly. Accordingly, Milner's valve is also structurally and functionally significantly different from that illustrated in Figure 1 of the present application.

In summary, none of the cited prior art teaches a valve that is configured to respond to a difference in pressure between a sensed temperature pressure and an inlet pressure of liquefied gas.

The Examiner has rejected claims 16-19, 21, 41-45, 47-49, 64-66, 68, and 71 under 35 U.S.C. § 102(b) as being anticipated by Tanaka. The Examiner has rejected claims 16-19, 21, 41-45, 47-49, 64-66, 68, and 71 under 35 U.S.C. § 102(e) as being anticipated by Milner. Claims 1-5, 7-13, 15, 35-38, 40, 54-56, 69, and 70 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Tanaka or Milner in view of Jurcik et al. (U.S. Patent No. 6,076,359, hereafter "Jurcik") or Fortney (U.S. Patent No. 3,250,723). Finally, claims 6, 14, 20, 39, 46, and 67 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Tanaka or Milner in view of Jurcik or Forney, and further in view of Barbulesco or Nielsen.

Referring now to the rejection of claim 16, claim 16 recites, in part, "the valve being moved toward the closed and open configurations in response to variations in the difference in the sensed temperature pressure and the pressure of the liquefied gas supplied by

the source of liquefied gas." Tanaka fails to teach this limitation, teaching instead, as previously explained, a valve configured to respond to a difference in pressure between an outlet temperature pressure and pressure in the evaporator. This may be seen by reference to Tanaka's Figure 3 and to the text of the description which describes the configuration of the space above the diaphragm at column 9, lines 59-63, and describes the configuration of the space below the diaphragm at column 10, lines 35-41. Accordingly, Tanaka fails to teach the limitations of claim 16.

For his part, Milner teaches a device that is configured to respond to pressure at an outlet of the device, opening and closing as the pressure at the outlet drops and rises, respectively. This function is made clear by Milner at column 4, lines 21-36.

Inasmuch as the cited prior art fails to teach all the limitations of claim 16, claim 16, together with dependent claims 17-34 is allowable over the cited prior art.

Claim 41 recites, in part, "adjusting the flow rate of the liquefied gas into the heat exchanger in response to the difference in the sensed temperature pressure and the pressure of the liquefied gas supplied by the source of liquefied gas."

Tanaka and Milner each fail to teach this limitation of claim 41, Tanaka teaching instead a device configured to respond to a difference in pressure between a sensed temperature at the output and a fluid pressure at the evaporator, and Milner teaching a device configured to respond to changes in pressure at an output of the device. Accordingly, claim 41 is allowable over the cited prior art, together with dependent claims 42-53.

Claim 64 recites, in part, "third means for sensing a difference in the sensed temperature pressure and a pressure of the liquefied gas supplied by the source of liquefied gas; and fourth means for regulating a flow of liquefied gas from the source of liquefied gas to the first means in response to the difference sensed by the third means."

The cited prior art fails to teach all the limitations of claim 64, which is therefore allowable thereover. Dependent claims 65-68 are also therefore allowable.

Claim 71 recites, in part, "a flow regulator having a first input coupled to the output of the temperature sensor, a second input coupled to a source of liquefied gas and configured to receive a flow of liquefied gas at a second pressure, and an output configured to be

coupled to an input of the heat exchanger, the regulator configured to compare the first pressure to the second pressure and to adjust a flow of liquefied gas from the second input to the output to a flow rate selected according to a pressure differential of the first and second pressures."

Tanaka and Milner each fail to teach this limitation, which is therefore allowable.

Claim 1 recites, in part, "a diaphragm within the valve body dividing the thermal expansion chamber from the liquefied gas inlet chamber, the diaphragm being movable in response to a pressure imbalance in the thermal expansion chamber and the liquefied gas inlet chamber... and a valve positioned between the liquefied gas inlet chamber and the liquefied gas outlet chamber... the valve being moved toward the closed and open configurations in response to movements of the diaphragm resulting from the differential pressure in the thermal expansion chamber and the liquefied gas inlet chamber, with the pressure in the thermal expansion chamber being dependent on the sensed temperature of the released gas vapor from the heat exchanger outlet and the pressure in the liquefied gas inlet chamber being dependent on the pressure of the liquefied gas supplied by the source of liquefied gas."

Tanaka and Milner each fail to teach the cited limitations of claim 1. For their part, neither Jurcik nor Fortney supply the missing teachings.

Claim 1 also recites, "a heat exchanger having an inlet structured to accept liquefied gas, a heater to boil and superheat the accepted liquefied gas to a gas vapor, and an outlet structured to release the gas vapor." Fortney fails to teach this limitation, inasmuch as Fortney is directed to a device configured to mix a fuel with air and cause the fuel to burn or combust, thereby producing smoke. One having ordinary skill in the art would recognize that a device configured to boil a liquefied gas to produce gas vapor is significantly different from a device configured to burn a fuel and produce smoke. Accordingly, Fortney fails to teach this limitation.

Fortney states the following, "Use of the apparatus described hereinbelow and when practicing the method of the invention, the converter 120 is preheated to a temperature sufficient to cause burning, combustion or conversion of the smoke producing fuel...." (Column 6, lines 5-8), and "A slow burning or smolder effect is obtained as a result of the method and structure of the invention." (Column 5, lines 56-58).

For at least the reasons stated above, the cited references neither teach nor suggest all the limitations of claim 1, which is therefore allowable. Dependent claims 2-7 and 69 are also allowable together with independent claim 1.

While claims 1 and 8 differ in scope, arguments put forth in support of allowability of claim 1 are also valid with respect to the allowability of claim 8, which is therefore allowable over the cited prior art, together with dependent claims 9-15.

Claim 35 recites, in part, "a plurality of vaporizers, each of the vaporizers including:...a capacity control valve having a temperature sensor configured... to produce a sensed temperature pressure in response to the sensed temperature, a pressure sensor configured to sense the difference in the sensed temperature pressure and a pressure of the liquefied gas supplied by the source of liquefied gas,...and a valve regulating the flow of liquefied gas between the valve inlet and the valve outlet,...the valve being moved toward the closed and open configurations in response to the pressure sensor sensing the difference in the sensed temperature pressure and the pressure of the liquefied gas supplied by the source of liquefied gas."

Tanaka and Milner each fail to teach the cited limitations of claim 35. These limitations are also not taught by Jurcik nor Fortney. Neither Tanaka, Milner, Jurcik, nor Forney, either individually or in combination teach or suggest all the limitations of claim 35, which is therefore allowable. Dependent claims 36-40 are also allowable therewith.

Claim 54 recites, in part, "a heat exchanger having an inlet structured to accept liquefied gas, a plurality of positive temperature coefficient heater elements operable to supply heat to boil and superheat the accepted liquefied gas to produce a gas vapor, and an outlet structured to release the gas vapor."

Neither Tanaka, Milner, Jurcik, nor Fortney teach this limitation, nor is this limitation made obvious by the teachings of any of the cited prior art, either in combination or individually. For this reason, as well as for reasons previously discussed with reference to other claims, claim 54 is allowable over the cited prior art. Claims 55-58, as dependent claims from allowable claim 54, are also therefore allowable.

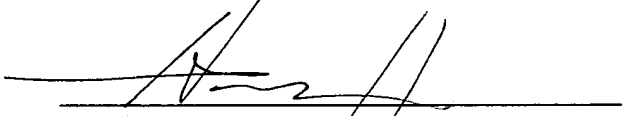
The remaining rejections are directed to dependent claims, and are thus moot in view of the allowability of the allowable base claims.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited. In the event the Examiner finds minor informalities that can be resolved by telephone conference, the Examiner is urged to contact applicants' undersigned representative at (206) 622-4900 in order to expeditiously resolve prosecution of this application.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

SEED Intellectual Property Law Group PLLC



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